REMARKS

In the Office Action the Examiner stated that formal drawings were required. Applicant has herewith submitted 26 pages of formal drawings.

Upon entry of this Amendment, claims 12-24, 26-34 and 36-95 are all the claims pending in the application. Claims 86-95 have been added. As mentioned in Applicant's previous responses, claims 1-11 were canceled in the Preliminary Amendment filed July 28, 2000. Claims 25 and 35 were canceled in the prior response. Claims 20-22, 30-33, 53, 54, 57-60, 63, and 65-68 are withdrawn from consideration as being drawn to a non-elected invention. Applicant gratefully acknowledges the allowance of claims 12-19, 24, 26-29, 34-40, 62, 69-76 and 80-82 and the indicated allowable subject matter in claims 42-52, 55, 56 and 61, which are presently objected. Claims 23, 41, 78, 79 and 83-85 presently stand rejected and claim 83 is also objected to because of an informality.

Specifically, claims 78 and 83-85 are rejected under 35 U.S.C. § 102(e) as being unpatentable over Erten et al. (USP 6,236,862).

Claim 23 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Erten et al. in view of Hattori et al. (USP 4,057,758).

Claim 41 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Erten et al. in view of Gruenberg (USP 3,757,335).

Claim 79 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Erten et al. in view of Laflin (USP 5,140,702).

For the reasons set forth below, Applicant respectfully traverses the rejections and requests favorable disposition of the application.

Argument

In regard to the rejection of claim 78, Applicant submits that the prior art of record fails to teach or suggest a system in which a signal is received within a wide receive bandwidth, wherein the overall bandwidth received is selected to be relatively wide, as compared to the bandwidth of the receive signal, in order to permit a level of noise to enter the system that is approximately equal to the signal level or combining predetermined surrogate carrier values with the receive signal and determining which of the different surrogate values is closest to the actual receive signal, as required by claim 78.

As described in the present specification, an estimate of the signal strength of the received signal can be determined by utilizing a "probing" arrangement that compares carrier signal amplitudes of predetermined values to the carrier signal. The approximate signal level, e.g., exclusive of noise, is obtained when there is a "cycle match" between the signal and the appropriate probe carrier amplitude from among the several pre-established carrier probe amplitudes. (See, for example, pages 31-34).

Erten et al. does not anywhere disclose, or even suggest, a system with these features, i.e., where broadband noise is permitted to enter the system (i.e., as a consequence of receiving over a broad band of potential receive signals) and combining predetermined values with the signals values to determine which noise value is closest to the signal value.

For at least this reason, claim 78 is allowable over the cited prior art and the rejection of claim 78 should be withdrawn.

In regard to claim 83, Applicant has amended the claim to remove the word *apriori*. Thus, the objection to claim 83 should be withdrawn.

Regarding the prior art rejection of claim 83, Applicant submits that claim 83 is patentable over the cited prior art at least because each of the prior art references of record includes a processor or a method wherein either a pilot pulse is used, a diversity receive method is employed, i.e., where multiple receive points are established to receive the same signal(s), or pre-established signal conditions are "known" by the processor for assisting in signal discrimination. Claim 83, as presently presented explicitly excludes each of these conventional processing techniques and, accordingly, is patentable over the prior art.

In regard to the rejection of claim 84, Applicant respectfully submits that Erten et al. fails to teach or suggest the recited processor that *compares the respective receive signals to multiple predetermined surrogate values and determines when the amplitude*

of the receive signals is closest to one of the surrogate values. As mentioned above in regard to claim 78, an aspect of the present invention is to utilize a so-called "topographic number array" which results in a match being determined between injected surrogate, noise, voltages and the value of the received signal.

In comparison, Erten et al. discloses a system in which adaptive interferer rejection is used. (Col. 17, lines 18-62). Erten et al. first describes disadvantages of an adaptive beamformer (ABF), and then goes on to explain an alternative regime to ABF. As is known in the art, an ABF system includes a plurality of sensors each receiving the same signal(s). Digital signal processing (DSP) is then used to "form" the sensor beam by placing nulls in the spatial directions not of interest and increasing the gain in the direction that is of interest, e.g., by forming a "pencil" beam in this direction. By forming the receive beam in this manner, it is possible to reject interfering signals and maximize the level of the intended receive signal. Unlike the present invention, however, ABF requires "prior knowledge of the location of the signal source". (Col. 17, lines 30-33). ABF also is a "narrowband" system, as opposed to the broadband system of the present invention.

Nowhere in Erten et al. is it disclosed that the receive signals are compared to "multiple predetermined surrogate values" and nowhere is it disclosed to "determine when the amplitude of the receive signals is closest to one of the surrogate values". For at least this reason Erten et al. does not anticipate claim 84 and the rejection should be withdrawn.

Claim 85 is patentable over Erten et al. at least by virtue of its dependency from claim 84, discussed above. Additionally, claim 85 is independently patentable over Erten et al. because Erten et al. fails to teach or suggest performing the comparing and determining steps in parallel. Contrary to the grounds of rejection, neither figure 21 nor its attendant description disclose the parallel processing claimed. As shown in figure 21 and described in the attendant description, multiple composite signals from independent signal sources (S_N) are received by a respective number of receivers. A signal separation process is conducted and a signal conditioner/processor then derives respective approximations of the signals, S_N. There is no disclosure, however, of any comparison or determining processes that are conducted in parallel. For this additional reason, claim 85 is patentable over the cited prior art.

Regarding claim 23, Applicant has amended the claim to more clearly distinguish over the prior art. Applicant submits that claim 23 is patentable over the prior art at least because the proposed combination of Erten et al. and Hattori fails to teach or suggest all of the features presently recited. In particular, as depicted in figure 10(a) and now clearly recited in claim 23, the phase centers of the respective array elements are spaced apart in half-wavelength multiples. As recognized in the grounds of rejection, page 5, par. 8, neither Erten et al. nor Hattori disclose this feature. Specifically, the grounds of rejection state that "Erten et al. differs in teaching a separation of different numbers of half wavelengths", and that "Hattori teaches the

distance between two antennas exceeds one half the wavelength of the employed carrier wave."

The grounds of rejection appear to argue that placing the array phase centers at half-wavelength multiples is obvious in view of the teachings of Hattori, i.e., where the distance between two antennas exceeds one half wavelength. Applicant submits, however, that merely making the distance between two antennas more than half the wavelength of the carrier signal is not the same as making the distance between the antennas, or antenna array elements, multiples of half the wavelength. As described in the specification, for example at page 14, lines 14-16, "this spacing provides azimuth discrimination enhanced by the phase multiplying operation which can be performed mathematically by subsequent digital processing." At least because the proposed combination of Erten et al. and Hattori fails to teach or suggest that the distance between array elements is a multiple of half the wavelength, claim 23 is patentable over the prior art of record.

In regard to claim 41, Applicant submits that the proposed combination of Erten et al. and Gruenberg fails to teach or suggest,

> sensing how the injection of a programmed iterative value will change a relative location within said array by ***sensing, in progressive steps, when each injected iterative value causes a match*** in the numerical values of signal-plus-noise ***from two rows of the numerical array to be further from, or closer to, a topocentric center*** of left and right portions of the array.

Although Gruenberg may arguably disclose right and left array elements, e.g., 10A, 11A, 12A and 13A, there is no disclosure within either Gruenberg or Erten et al., and the Examiner points to no specific disclosure, of sensing when injected iterative values match the signal-plus-noise value received by any of the elements and, further, there is no disclosure within either reference of sensing how each injected value changes a relative location with respect to a topocentric center of the right and left portions of the array.

Because the proposed combination of Erten et al. and Gruenberg does not disclose the above features recited in claim 41, claim 41 is patentable over the prior art.

Because claims 42-52, 55, 56 and 61 depend from claim 41, discussed above, Applicant submits that claims 42-52, 55, 56 and 61 are patentable over the prior art of record for at least the same reasons as those set forth above in regard to claim 41.

In regard to claim 79, Applicant submits that the proposed combination of Erten et al. and Laflin fails to teach or suggest the stand alone antenna as claimed. For example, contrary to that which is asserted in the grounds of rejection, Erten et al. does not disclose introducing an appropriate "sequence of surrogate signal estimates" where one of the surrogate signal estimates "causes a signal to erupt from the background noise so as to create a vastly improved signal-to-noise ratio." At column 9, lines 2-3, Erten et al. discloses "two mixed signals" that "originate from two different sources." As disclosed, the two mixed signals are delayed and respective gain, determined by the entries of the mixing matrix, is provided to the signals. The disclosed mixing process,

however, does not introduce surrogate signal estimates and it does not cause a signal to erupt from the background noise with an improved signal-to-noise-ratio. For at least this reason, claim 79 is patentable over the prior art of record.

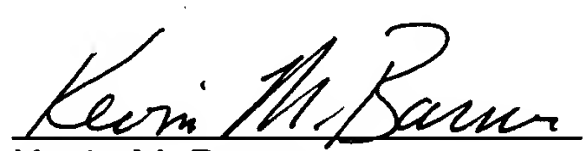
Patentability of New Claims

For additional claim coverage merited by the scope of the invention, Applicant has added new claims 86-94. Applicant submits that the prior art does not disclose, teach, or otherwise suggest the combination of features contained therein.

Conclusion

In view of the foregoing amendments and remarks, the application is believed to be in form for immediate allowance with at least claims 12-19, 23, 24, 26-29, 34, 36-52, 55, 56, 61, 62, 64 and 69-94, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to **contact the undersigned** at the telephone number listed below.

Respectfully submitted,



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